CLAIMS

I claim:

1. A twin disk refiner comprising:

a housing having portions defining a stock inlet and portions defining a stock outlet downstream from the stock inlet;

a shaft which extends into the housing and which supports a rotor for rotation within the housing, and wherein oppositely facing refining disks are mounted on the rotor;

portions of the housing which define a first plate support structure through which the shaft extends;

a first fixed refiner disk mounted to the first plate support structure;

a second fixed refiner disk mounted to a second plate support structure;

a refining chamber defined within the housing between the first plate support structure and the second plate support structure, wherein the rotor is position within the refining chamber so that rotation of the rotor moves the oppositely facing rotor desks about the shaft in refining relation to the first fixed refining disk and the second refining disk; and

portions of the housing upstream of the refining chamber which define an upstream chamber in communication with the inlet, wherein the first plate support structure has an upstream face which is exposed to and substantially surrounded by the upstream chamber, such that fluid introduced into the housing at the inlet flows through the upstream chamber and then into the refining chamber, such that the first plate support structure is exposed to fluid pressure on its upstream face which counters the fluid pressure applied to the first fixed refiner disk within the refining chamber.

2. A disk refiner comprising:

a machine frame;

a shaft mounted for rotation on the machine frame and extending through a bulkhead into a refiner housing, a portion of the shaft extending into the refiner housing forming a spline;

a first non-rotating refiner disk mounted to a stationary support structure forming part of the refiner housing;

a second non-rotating refiner disk mounted on a sliding head in spaced parallel relation to the first non-rotating refiner disk for sliding motion towards the first non-rotating refiner disk;

a rotor having a central hub, the hub slidably mounting the rotor on the portion of the shaft forming the spline, the rotor supporting a third refiner disk in spaced parallel refining relation with the first refining disk, and a fourth refining disk in spaced parallel refining relation to the second refining disk, the shaft transmitting rotating motion through the spline to the rotor;

a stock inlet leading to a portion of the housing forming a circular flow path formed between an inner shell and an outer shell, the circular flow path for inducing stock to rotate about the shaft, the stock inlet being positioned so that gravity and centrifugal acceleration moves heavy weight tramp towards the outer shell;

an outlet for heavy weight tramp located near a lowermost portion of the outer shell;

at least one opening through the inner shell forming a means by which rotational motion of stock is preserved as the stock flows towards the rotor.

3. The refiner of Claim 1 wherein the stationary support structure forming part of the refiner housing forms part of the circular flow path so that hydraulic pressure due to the stock is presented to substantially all sides of the stationary support structure.

4. A pulp disk refiner comprising:

a machine frame on which a shaft is mounted for rotation, the shaft being connected at a first end to a drive motor, and wherein a second end of the shaft passes into a refiner housing through a circular bulkhead, wherein the second shaft end is machined to form a spline to which a rotor is mounted;

portions of a drive side of the refiner housing which define a stock inlet through which stock is supplied to a shroud, the shroud defining a passageway between an outer conical shell, an inner cylindrical structure and a drive side stationery plate support structure, the inner cylindrical structure surrounding the bulkhead, and wherein the shroud causes the stock to rotate producing an acceleration directed radially outwardly of the cylindrical structure, the passageway terminating at a baffle, thus causing the stock to pass through a plurality of holes in the inner cylindrical structure to enter a reservoir formed on the inside of the inside cylindrical structure surrounding the shaft, and wherein the circular path about which the stock is forced to flow separates tramp metal and other heavy weight tramp , throwing it radially outwardly against the outer conical shell, wherein the radial acceleration produced is not so great that it causes heavy weight tramp to travel upwardly along the conical shell into engagement with the baffle;

a tramp outlet positioned near the lowermost portion of the shroud, and wherein rotary motion of the stock about the cylindrical structure persists as the flow passes through the holes so that the stock can flow through openings formed in the rotor with less resistance.

5. The refiner of Claim 4 wherein the shroud brings stock into engagement with a back side of the stationary plate support structure, said back side forming part of a triangular passageway, thus applying hydraulic support to the stationary plate support structure which allows the stationary plate support structure to be constructed of a substantially lighter weight structural section.

6. The refiner of Claim 4 wherein a movable stationery plate is mounted on a sliding head, and wherein the sliding head is mounted for translation toward and away from the rotor, the sliding head being mounted by a bearing ring to a removable door which forms part of the refiner housing, the sliding head being balanced by a counterweight and driven by a mechanism which employs a variable frequency drive motor.

7. The refiner of Claim 4 wherein the rotor is mounted on a spline formed at the end of the shaft, and wherein the spline transmits rotary power to the rotor but is not affixed to the rotor, and wherein sufficient play between the rotor and the spline is provided so that the rotor slides along the spline, thus positioning the rotor in response to hydrodynamic forces between the stationary plate mounted on the support structure and the stationary plate mounted on the sliding head and a very small amount of tilting of the rotor with respect to the axis of the shaft is also accommodated by the spline hub mount.

8. The refiner of Claim 5 wherein sliding head supports the door side stationery plate on a support structure which allows stock to flow behind about thirty percent of the outer circumference of the support.

9. The refiner of Claim 4 wherein the passageway has a triangular cross-section.

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